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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/823,895	04/13/2004	Michael A. Rothman	P19009	5656

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KONRAD RAYNES & VICTOR, LLP.
ATTN: INT77
315 SOUTH BEVERLY DRIVE, SUITE 210
BEVERLY HILLS, CA 90212

EXAMINER

YU, JAE UN

ART UNIT	PAPER NUMBER
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2185

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05/04/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/823,895	Applicant(s) ROTHMAN ET AL.	
	Examiner Jae U. Yu	Art Unit 2185	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 February 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. <u>20061214</u> |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The examiner acknowledges the applicant's submission of the RCE dated 2/12/07. At this point claims 1, 3, 6, 7, 8, 10, 12, 15, 16, 17, 19, 20, 23, 25, 28, 29 and 31 have been amended. Thus, claims 1-31 are pending in the instant application.

Arguments Concerning Prior Art Rejections

1st Point of Argument

Regarding independent claims 1, 10, 19 and 23, the applicant does not agree with the examiner's point reflected in the Final Office Action, on pages 7-8 since the claims are amended. The applicant supports his argument by stating that Lawrence discloses defragment in response to "deletion" not in response to "update". However, the term "update" means any changes made to a storage device. Therefore, the "deletion" corresponds to the "update" from the claim.

2nd Point of Argument

Regarding claims 3, 12, 20 and 25, the applicant argues that Lawrence fails to teach executing the I/O request without defragmenting if the amount of defragmentation does not exceed the fragmentation threshold. The examiner maintains his position regarding that the "fragmentation threshold" corresponds to "zero" (no fragmentation in the disk). Therefore, defragmenting is inherently not executed if there is no fragmentation in the disk ("not exceed the fragmentation threshold").

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3rd Point of Argument

Regarding claims 7, 16 and 29, the examiner maintains his position as he did in the Final Office Action. The applicant states that a system/an user can "override" write protection to enable disk writing. However, if a system "overrides" and starts to write data to the disk then the disk is no longer "write-protected" at this point. Therefore, the examiner does not find the applicant's argument persuasive.

4th Point of Argument

Regarding claims 8-9, 17-18 and 30-31, the applicant argues that since the recited function can be performed by "a program", the "storage controller / device driver" is patentably distinct. However, even if Lawrence discloses "a program" like the applicant assumes, "a program" cannot produce any tangible results without being executed in a hardware.

5th Point of Argument

Regarding claims 4-5, 13-14 and 26-27, the applicant argues that Douglass et al. fail to cure Lawrence's deficiencies. However, Douglass et al. clearly teaches performing defragmentation if there are enough power sources in paragraph 32.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-3, 7-9, 10-12, 16-18, 19-21, 23-25 and 29-31 are rejected under 35 U.S.C. 102(b) as being anticipated by Lawrence et al. (US 6,253,300).

2. Independent claims 1, 10, 19 and 23 discloses, "circuitry, a storage controller and an article of manufacture that are enabled to" perform the following method.
Lawrence et al. disclose the following method that is executed in a computer system. Therefore, the computer system inherently includes the "circuitry, a storage controller and an article of manufacture" from the claim.

"Receiving an I/O request [Copy request, Column 5, Lines 37-39] to update an object ["File", Column 5, Lines 37-39] in storage ["Storage Medium", Column 5, Line 42]"

"Defragmenting the object in storage [Defragmenting the file in storage, Column 5, Lines 37-39] so that blocks in storage including the object are contiguously ["Stored in contiguous region of the storage medium", Column 5, Lines 41-42] in response to receiving the I/O request to update the object, wherein the request to update the object causes the defragmentation operation [Running a defragmentation program before the copy operation, Column 5, Lines 37-39]"

"Executing the I/O request to update the object in storage [**Copying the files in storage, Column 5, Lines 37-39**]"

3. **Claims 2, 11 and 24** disclose, "the I/O request is executed with respect to the object after defragmenting the object". **Lawrence et al. disclose copying file ("I/O request to the object" from the claim) after running a defragmentation program in column 5, Lines 37-39.**

4. **Claims 3, 12, 20 and 25** disclose, "determining whether an amount of fragmentation of the object in the storage exceeds a fragmentation threshold [**Any amount of fragmentation higher than zero, Column 5, Lines 37-39**] in response to receiving the I/O request, wherein the object is defragmented [**Eliminating fragmentation on the file, Column 5, Lines 37-39**] if the amount of fragmentation exceeds the fragmentation threshold [**If fragmentation exists, Column 5, Lines 37-39**], and wherein the I/O request to update the object is executed without defragmenting the object in response to determining that the amount of fragmentation does not exceed the fragmentation threshold".

5. **Claims 7, 16 and 29** disclose, "determining whether the object is read-only, wherein the object is defragmented if the object is not read-only, wherein the I/O request to update the object is executed without defragmenting the object in response to determining that the object is read-only". **Read-only means that the object is write-**

protected. Since defragmenting comprises the process of copying/deleting of an object to a different location, Lawrence et al. inherently defragment only “not write-protected” (“not read-only” from the claim) objects.

6. **Claims 8-9, 17-18 and 30-31** disclose, “the operation of receiving the I/O requests, initiating the operation to defragment the object, and executing the I/O request of defragmenting the object in storage are performed by a storage controller managing I/O requests to the storage and a device driver for the storage providing an interface to the storage”. **Lawrence et al. disclose the operation of defragmenting the object in storage in a computer system. Therefore, the computer system inherently includes the “storage controller” and the “device driver” from the claim.**

7. **Claim 21** discloses, “the storage controller and storage device are included in the same housing [Computer System]”. **Lawrence et al. disclose defragmenting in a computer system that inherently includes the “storage controller” and the “storage device” from the claim.**

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claim 22 is rejected under 35 U.S.C. 103 (a) as being obvious over Lawrence et al. (US 6,253,300) in view of Karger et al. (US 5,339,449).
2. As per claim 22, Lawrence et al. disclose, "a processor [Computer System]".

Lawrence et al. do not disclose expressly, "a memory enabled to store the I/O request before the I/O request is received by the storage controller".

Karger et al. disclose the I/O request queue in column 20, at lines 47-50.

Lawrence et al. and Karger et al. are analogous art because they are from the same field of endeavor of memory management.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Lawrence et al. by including an I/O request queue as taught by Karger et al. in column 20, at lines 47-50.

The motivation for doing so would have been to process the I/O requests based on their priorities in the queue as expressly taught by Karger et al. in column 20-21, at Lines 67-5.

Therefore, it would have been obvious to combine Karger et al. with Lawrence et al. for the benefit of prioritized I/O process to obtain the invention as specified in claim 22.

3. Claims 4-5, 13-14 and 26-27 are rejected under 35 U.S.C. (a) as being obvious over Lawrence et al. (US 6,253,300) in view of Dougliis et al. (US 2005/0108075).

4. As per claims 4-5, 13-14 and 26-27, Lawrence et al. disclose, "performing defragmentation in response to receiving the I/O request".

Lawrence et al. do not disclose expressly, "determining whether a user settable flag indicates to perform defragmentation, wherein the object is defragmented if the flag indicates to perform defragmentation" and "executing the I/O request without performing defragmentation if the flag does not indicate to perform defragmentation".

Dougliis et al. disclose deferring defragmentation if there is restriction of power usage ("flag" from the claim) in paragraph 32, wherein the "flag" is user settable since an user can alternate between restricted power source (battery) and unlimited power source (wall outlet).

Lawrence et al. and Dougliis et al. are analogous art because they are from the same filed of endeavor of defragmentation.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to modify Lawrence et al. by including a flag that defers defragmentation in case of battery use as taught by Dougliis et al. in paragraph 32.

The motivation for doing so would have been adaptive control of application power consumption in a mobile computer as expressly taught by Douglass et al. in paragraph 2.

Therefore, it would have been obvious to combine Douglass et al. with Lawrence et al. for the benefit of efficient power consumption to obtain the invention as specified in claims 4-5, 13-14 and 26-27.

5. Claims 6, 15 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lawrence et al. (US 6,253,300) in view of Ball et al. (US 2005/0162944).

6. As per **claims 6, 15 and 28**, Lawrence et al. disclose the method and the system recited in claims 1, 10 and 23 including the limitation, "the I/O request to update object is executed" and "the object is defragmented if the object is within one logical partition [the object within "a disk" being defragmented, Figure 7]".

Lawrence et al. do not disclose expressly not defragmenting the object in response to determining that the object is included in more than one logical partition.

Ball et al. disclose the object (Element 24) included in more than one logical partition (partitions a-d), wherein the active memory is not defragmented (Abstract).

Lawrence et al. and Ball et al. are analogous art because they are from the same filed of endeavor of defragmenting storage devices.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify Lawrence et al. by not defragmenting the active memory and defragmenting the redundant inactive memory instead as taught by Ball et al. in the abstract.

The motivation for doing so would have been to minimize the impact of defragmentation, thus, increasing the system performance as expressly taught by Ball et al. in paragraph 24.

Therefore, it would have been obvious to combine Ball et al. with Lawrence et al. for the benefit of mitigating the impact of defragmentation to obtain the invention as specified in claims 6, 15 and 28.

Conclusion

A. Claims Rejected in the Application

Per the instant office action, claims 1-31 have received a first action on the merits and are subject of a first action non-final.

B. Direction of All Future Remarks

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jae Un Yu who is normally available from 9:00 A.M. to

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5:30 P.M. Monday thru Friday and can be reached at the following telephone number:
(571) 272-1133.

If attempts to reach the above noted examiner by telephone are unsuccessful, the Examiner's supervisor, Sanjiv Shah, can be reached at the following telephone number: (571) 272-4098.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

4/29/2007

Jae Un Yu
Art Unit 2185



SANJIV SHAH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100